Statement Submitted to the U. S. Department of Energy,
Yucca Mountain Site Characterization Office
North Las Vegas, Nevada
on the

Yucca Mountain Preliminary Site Suitability Evaluation
by Denis E. Beller, Ph.D.
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on behalf of Prof. Per Peterson of the University of California at Berkeley
October 10, 2001

Good afternoon ladies and gentlemen. I am Dr. Denis Beller, and I am here today to present the statement of Professor Per Peterson, a long-time Nevada resident who now resides in California. Dr. Peterson requested that I read from the comments that he submitted on September 5th after carefully reviewing the PSSE and the science and engineering report.

Dr. Peterson grew up in Las Vegas and he was educated in Nevada, from elementary school through his Mechanical Engineering degree at the University of Nevada-Reno. He earned his Doctorate from the University of California at Berkeley, one of the most prestigious and environmentally and socially conscious universities in the nation. Dr. Peterson's expertise is in the areas of heat and mass transport, the primary processes that govern the performance of geologic repositories. He was a Presidential Young Investigator of the National Science Foundation there from 1990 to 1995, and he currently serves as a Professor and the Chair of their Department of Nuclear Engineering.

Dr. Peterson's review of the Preliminary Site Suitability Evaluation, which focused primarily on the engineered barrier system, can be summarized as follows:

The current engineered barrier system applies the well-established safety design principles that have been widely used for design and licensing of aircraft, skyscrapers, and nuclear reactors. Multiple, independent and diverse barriers have been used in the Yucca Mountain engineered-barrier system design so that the failure of any individual barrier will not degrade total system performance.

I add that this same design philosophy let the World Trade Center remain standing long enough for more than twenty thousand people to escape on September 11th.

Dr. Peterson continues: The multiple-barrier design approach of the Yucca Mountain Project includes a highly corrosion-resistant canister material that is predicted to have small to negligible corrosion over tens of thousands of years. The design also uses a titanium drip shield—another highly corrosion-resistant material—to prevent any contact of water with the canister. Thus even when analyses assume an unanticipated, non-mechanistic failure of one of the barriers, the system still achieves the same overall safe performance.

Thus one of Dr. Peterson's primary conclusions: "..... the current repository design is likely to be successful in meeting the applicable radiation protection standards established by the EPA and NRC," and ".... that the engineered-barrier system can meet the required licensing criteria by large margins."

Dr. Peterson also provided a comparison between the Yucca Mountain site and other geologic media being considered by various international repository-research programs, so that such a comparison is included as a part of the public record for the decision making process.

With a large and diverse array of geologic settings, the United States had the unique opportunity to identify a potential repository site that is located above the water table in **unsaturated** hard-rock media. Other international repository programs have adopted safety design principles similar to those of the Yucca Mountain design, but they have focused on **saturated** media which require that the waste be embedded and sealed into small bore-holes. Conversely, the placement of waste in open tunnels in Yucca Mountain provides a unique flexibility because it will be easy to move and rearrange waste canisters, **or** to retrieve and use this material, **or** to select alternative disposal methods.

These features that are unique to unsaturated geologic media, as at Yucca Mountain, should be given special consideration.

In addition, because the tunnels at Yucca Mountain are drilled into hard, stable rock, decisions to close the repository can be delayed indefinitely, which will actually **minimize** the burden on future generations to manage this waste.

If the Yucca Mountain Suitability Decision is negative, the United States must then site a repository in alternative geologic media, different from the unsaturated tuff found at Yucca Mountain. This would be a negative legacy for future generations of Americans.

Dr. Peterson concludes his letter to the DOE with the following:

"The Yucca Mountain Preliminary Site Suitability Decision report gives strong evidence that, with the current design of engineered barriers, Yucca Mountain can be licensed to meet the radiation protection standards established by the EPA and NRC. The site is unique among possible geologic media for the flexibility it provides for future generations to make their own decisions about the management of these nuclear wastes, while also minimizing the burdens our generation will place on these future generations. I support a positive site suitability decision."

Sincerely yours,

Per F. Peterson

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